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ABSTRACT

The purpose of this study was to determine the effects of two types of teacher inservice education programs upon fourth-grade students' achievement in solving mathematics story problems. Participating teachers attended two types of teacher inservice education programs; a traditional program, and a brief, narrowly focused special program (2.5 hours of training). Using posttest control group design and the t-test for independent samples, it was found that students (n=45) whose teachers had experienced the brief, narrowly focused teacher inservice training for teaching mathematics story problems did not achieve significantly higher test scores than did the students whose teachers had received more traditional teacher inservice training. Appendices include: (1) "Teacher Packet: Addition and Subtraction Story Problems"; (2) "Teacher Packet: Multiplication and Division Story Problems"; and (3) "Story Problem Skills Test." (Author/YP)

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Reading Story Problems: Research on the Impact of Brief, Narrowly Focused Inservice

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Paper submitted at the International Reading Association
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Reading Story Problems:
Research on the Efforts of Brief,
Narrowly Focused Inservice

Abstract

The purpose of this study was to determine the effects of two types of teacher inservice education programs upon fourth-grade students' achievement in solving mathematics story problems. Using posttest control group design and the t test for independent samples, it was found that fourth-grade students (N=45) who had teachers who had experienced brief, narrowly focused teacher inservice training for teaching math story problems did not achieve significantly higher tests scores than did the fourth-grade students (N=37) who had teachers who had received more traditional teacher inservice training ($P<.05$). It was concluded that the timing of presentations of inservice training for teachers does not significantly affect student performance in solving mathematic story problems.

Reading Story Problems: Research on the Effects of Brief, Narrowly Focused Inservice

A perennial problem that faces teachers in elementary schools today is how to assist children to learn to read and solve story problems in mathematics. The National Council of Teachers of Mathematics (1980) has designated problem-solving as the number one priority of the eighties. Teachers observe constantly that many students, even those who are otherwise good readers, perform poorly in deciphering the meaning of story problems. Story problems have been the nemesis for both teachers and their students for years.

The reasons for children's difficulty in learning to solve problems are varied. One of the more significant reasons that children have difficulty in successfully solving story problems involves language. Words frequently used by children in everyday speech also have use in a mathematical context. Fendel (1987) indicates that: "Often there is a conflict between the mathematical meaning of a word and a child's intuitive or daily use of the word. Neither is incorrect, but the conflict must be clarified and resolved. Sometimes that can be done by refining and adding to the child's original concept. Other times we simply must agree that the word will

have one meaning during mathematics classes and another meaning the rest of the time" (p. 1).

Review of the Literature

Many researchers have investigated over the past decade factors which affect students' learning to solve story problems. Many of the investigations focused upon the nature of the problem, meaning that both mathematical and language skills are needed to solve story problems. Wheeler and McNutt (1983) investigated the influence of syntax upon remedial students' ability to solve story problems in mathematics. The findings of this study indicated that student success in solving word problems on achievement tests is related to those students' syntax abilities and mathematical abilities.

This relationship between reading ability and success in solving word problems in mathematics was supported by Muth (1982). In a study of 200 sixth grade students, it was found that reading ability was related to solving story problems in mathematics.

While students' success in solving story problems in mathematics appears to be related to reading ability, the readability level of the story problem is less significant. Fitzgerald and Cullenan (1984) and Paul,

Nebbelink and Hoover (1986) found that when the readability is within a few grade levels of the student's reading level, performance is unaffected.

While the relationship between language and story problems was the focus of several studies, other researchers attempted to determine the effects of varied models of instruction upon achievement in story problems. Witson (1982) compared fourth and fifth grade students' progress when control groups were taught using traditional methods and experimental groups were taught using a new model instructional unit that included group discussion and demonstrations. Results of the study indicated that the experimental groups were more successful than were their counterparts in the control groups.

The effects of providing direct and detailed instruction upon students' abilities to solve story problems has been studied. Darch and others (1983) found that students taught using direct instruction scored higher than did those students placed in traditional instructional groups.

Yancey (1987) found that students can be taught to develop diagrams depicting story problems and that this process assisted students in learning to solve story problems. It was further found that teachers could learn to teach the techniques of diagramming in less than ten hours.

A review of the literature revealed that varied attempts have been made to determine reasons that students have difficulty in learning to solve story problems. Additionally, researchers have investigated the impact of specific teaching techniques upon students' learning to solve story problems. Techniques such as using small group work, direct instruction, and diagramming were found to be effective in assisting students to learn to solve story problems.

How can teachers learn to use the newer techniques that assist students in learning to solve story problems? Many school districts are providing inservice training for teachers that is designed to accomplish this. Specifically, many school districts are organizing an inservice education program designed to improve the skills of teachers in teaching story problems in mathematics. Generally, these programs are reactive to the acute problem.

Orlick (1989) described reactive inservice education projects. He stated, "Generally, the administration quickly establishes some contingency plan or techniques to alleviate these crises or placate external forces. Reactive responses tend to be inadequate, poorly planned, and in the long run, inconsequential. This is not the vision of success" (p. 7).

Orlich (1989) suggests that a more effective way of implementing change is by using a proactive staff development plan. Such a program is designed to develop the resources of the organization and the individuals that function in the organization. Additionally, a proactive staff development program anticipates and addresses the needs of organizations in a rapidly changing society by promoting growth of individual. Growth can be accomplished by inservice education that helps teachers develop artistry in teaching (p. 8).

Method

The purpose of this study was to investigate the effects of two types of teacher inservice education programs upon fourth-grade students' achievement in solving mathematics story problems. The two types of teacher inservice education programs compared were traditional inservice education programs and brief, narrowly focused inservice education programs.

As a matter of policy, students from the school involved in the project were assigned to one of the four fourth-grade classes using random procedures. Teachers and their corresponding classes were assigned to either the control or experimental group using random procedures.

Participating teachers in both types of workshops were taught identical content in February, 1989, by the same instructor, received the same teaching aids for use with their students, and received a total of two and one-half hours of training. The only difference between the two types of programs was the timing of the sessions.

In this study the control group's teachers attended a two and one-half hour traditional inservice education program. The experimental group's teachers were taught in three 30-minute sessions once a week. Each of the 30-minute sessions were focused on only one or two skills taught in the program and was followed-up two days later with a 20-minute session designed to reinforce skills learned and correct any problems. Other than timing, all other factors were the same for both groups.

A posttest control group design (see Figure 1) was used in the study. The control group was composed of two fourth-grade teachers and their thirty-seven students. The experimental group contained two fourth-grade teachers and their forty-five fourth-grade students. Seven students from the two groups were not included in the study since they withdrew from school prior to the time the study was completed or entered school after the study was initiated.

Figure 1

Group Assignment	N	Treatment	Posttest
Control Random	37	Traditional Coaches Inservice	Story Problem Skill Test
Experimental Random	45	Brief Narrowly Focused Inservice	Story Problem Skill Test

Subjects

The subjects of this study comprise the total population of fourth-grade students and their teachers at a lower-middle class elementary school in Pontotoc County, Oklahoma. The school is in a rural setting and has a diverse student body composed of Caucasians, Native Americans, and Afro-Americans.

Students were assigned to classes randomly as a matter of school policy. For this study, individual classes were randomly selected for both the control and experimental groups. Only students that completed the program were included in the study. A total of 7 students were not included in the study.

Instruments

The Story Problem Skills Test (see Appendix C) was developed for this study. The test was issued to and reviewed by area teachers and university math educators for face validity. The test was administered to 21 fourth-grade students. The results of this test were then compared to actual ability to perform the operations. On a case by case basis, student performance and test results were related.

The research was designed to test the null hypothesis that there is no significant difference between the traditional methods of scheduling inservice education and the brief, narrowly focused inservice education. The statistical treatment was a t test for independent samples. Alpha was set at .05 using a two-tail test.

Training

This research project involved using direct instruction on solving word problems by having children dramatize problems, model the problems with markers, model the problems with number lines, and model with play money. Guided discovery with frequent learner response was used.

Two teacher packets (see Appendix A and B) were used in the sessions, one for addition/subtraction word problems and one for

multiplication/division word problems. The first five to ten problems in each packet had the problem with step-by-step instructions for the teacher as far as questions to ask, how to model the problem, and what to write on the chalkboard or overhead. The next activity consisted of a set of word problems for heterogeneous groups of four to five students to solve and model with each child taking a problem and the others helping as needed. The strategy was continued so that the management of the instruction maintained the following pattern:

A. Teacher-directed instruction and modeling with the whole class;
B. Small Groups of four or five children with each child taking a problem on the student worksheet which told how to model the problem. Other children helped as needed;
C. Small groups with problems from the text;
D. Individual work on 5 to 10 word problems from the text with possible pairing of weaker students with stronger ones;
E. Group sharing to let each child go through one problem with the others helping to correct; and
F. The teacher works with the whole class treating specific difficulties noted during the other activities.

The word problems in the teacher packets were selected in a manner to ensure examples of the various types of subtraction, multiplication, and division. The various types were represented in both teacher-directed portions and the students' small group portions of the packets.

Results

Table 2 shows a comparison of the test results for students whose teachers participated in the two differing formats of inservice training. The mean score for the control group (N=37) when tested using the Story Problem Skills Test was 7.05 and the mean score for the experimental group (N=45) when tested using the same test was 8.62. While the difference between the two means was 1.57 the difference was not found to be significant at alpha .05 when the scores were processed using the t test for independent samples using a two-tailed test. The calculated t test value was -1.943. The critical t test value to be considered as significant at alpha .05 using a two-tailed test was $\pm$ 2.000. Therefore, the scores were not found to be significantly different and the null hypothesis was accepted.

Table 2
Results of t Test Comparing
Student Achievement on
Story Problem Skills Test.

CONTROL GROUP

N OF ONE = 37
SUM OF SCORES = 261
MEAN = 7.05
SUM OF SQUARED SCORES = 2277
THE 'SS' OF ONE = 435.89

EXPERIMENTAL GROUP

N OF TWO = 45
SUM OF SCORES = 388
MEAN = 8.62
SUM OF SQUARED SCORES = 3970
THE 'SS' OF TWO = 624.58

THE t VALUE IS -1.943
THE DEGREES OF FREEDOM ARE 80

Conclusion

The purpose of this study was to determine the effects of two types of teacher inservice education programs upon fourth-grade students' achievement in solving mathematics story problems. Since the null

hypothesis was accepted, this study indicates that the treatment variable, breaking an inservice education into components, does not significantly improve the degree of student learning as measured by a posttest. While the results of this study indicate that no significant difference was found on the dependent variable, student achievement, caution should be used in generalizing findings.

Differences were found when the mean scores were compared and the difference favored the experimental group. These differences, however, were not significant using a t test at alpha 05 using a two-tailed test.

Factors other than those studied may have contributed to the findings. While Brophy (1979) indicated the need to study intact classrooms, it was recognized that the research may be less exact than more rigorously controlled research designs. For example the tendency of teachers to meet expectations in research situations might have somewhat influenced the outcome of the study.

One other factor that may have affected the results of the study was the timing of the posttest. One of the two classes that formed the experimental group was tested immediately prior to a recess period. It was reported that several students from this class did not make efforts to solve the problems.

Further study is therefore recommended to study the effects of brief, narrowly focused inservice education programs. It would appear that, although this study did not find the brief, narrowly focused inservice education model to be significantly more effective than the traditional model, further study of the topic is warranted.

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Appendix A

Teacher Packet

Addition and Subtraction Story Problems

Materials Needed:

1. Student Worksheet on Addition and Subtraction Problems for each student

2. 15 lima beans for each child or other kind of small markers

3. 5 pinto beans or different markers from the lima beans

4. Play money or scrap paper to cut squares or rectangles to represent:

    6 quarters
    10 dimes
    4 nickels
    10 pennies
    5 one-dollar bills

(Have money or paper for each group of 5 students)

5. Paper and pencil

Teacher Packet

Addition and Subtraction Story Problems

Activity A: Teacher with the whole class

1. Jim saw 6 monkeys on one side of the monkey pit. Sally saw 9 monkeys on the other side. How many monkeys did they see in all?

   Have 6 children on one side of the room and 9 children on the other. Ask what number sentence fits the problem. Write 6 + 9 = ☐. Ask, "How many monkeys? What does the 6 mean? The 9? The 15?"

2. Ten monkeys were on a tree. Four of them jumped off. How many monkeys were on the tree then?

   Have ten children pretend to be monkeys in a tree. Have four jump off of the tree. Ask what number sentence fits this? 10 - 4 = [6]. Ask what the10 means? The 4? The 6?

3. Eight lions were in front of the cave. Some of them went into the cave. There were then three lions in front of the cave. How many went into the cave?

   Have the children use 8 lima beans to represent the lions. Have them cup their hands to represent the cave. Have all of the "lions" go into the cave but 3. How many lions went into the cave? Write 8 - ☐ = 3. Have the children interpret what each of the numbers mean. The 8? The 5? The 3? NOTE: 8 - 3 = ☐ may also be used. Interpret what each part of the sentence means.

4. The animal trainer wanted to work with six lions. He had two lions. How many more did he need?

   Have the children set 2 lima beans (lions) in front of them. Have them count from 2 and move beans next to the 2 beans (separated a little) to see how many had to be added to get 6. See if the children can figure out the number sentence.
   6 - 2 = 4 will do. Ask what each number means?
   Show 2 + ☐ = 6. This means the following: 2 added to how many would give me 6? Have children talk about what each part of the sentence means.

5. Two giraffes were eating leaves from a tall tree. First, four more giraffes joined them, then three more came. How many giraffes were at the tree then?

   Have children act out the situation pretending to be giraffes. Write the number sentence:
   2 + 4 + 3 = ☐ . Be sure to keep the proper order. Fill in the total for when they get together. Make sure that pupils notice that we looked at first the group of 2, then the group of 4, etc.

Activity B: Small Group Activity

Separate the children into groups by counting off to 5 with all the 1's in a group, 2's in a group and so on. Ensure that each group contains a variety of abilities.

For problems 6-10:

Have each pupil take a problem to read. Let the group model the problem with beans, markers or drawings. Have them decide what the number sentence would be to solve the problem.

Have them go through each number in the number sentence to determine what it means. The student whose problem it is acts as the secretary and writes or draws what the group decides and places the markers. Group members help the secretary if necessary.

Next, another student takes the next problem and figures it out.

6. Fifteen children were on the train. When the train stopped, five children got off and seven children got on. How many children were on the train then?
(Use beans or other markers to model.)

7. Four children were putting their money together to buy a pencil sharpener that cost $.67 including tax. Jimmy put in $.15, Sally put in $.06, Bert put in $.08, and Susy put in $.15. How much money do they need now?
(Use real money or play money or squares of paper for coins and act out.)

8. There were 15 parakeets and 5 parrots in a cage. How many more parakeets than parrots were there?
(Use 2 different kinds of markers to model this one.)

9. Jenna spent $.50 on cotton candy, $.60 on popcorn and $.70 on a coke. How much money did she spend?
(Use money or squares of paper for coins and act this out.)

10. Ben had $5. He spent $2.50 and loaned Sue $1.25. How much money did he have then?
(Use play money, real money, or pieces of paper with amounts and act out the problem.)

Activity C: Small Groups With Problems From the Text

Select ten addition/subtraction story problems from the text. Let the children work them in small groups, taking turns with the group and helping if needed.

Teacher monitors and helps students as needed.

Activity D: Individual Work

Select 5 to 10 story problems from the text on addition and subtraction for students to work on their own - may want to pair weak students with strong ones.

Activity E: Group Sharing

Let students take turns in small groups explaining each problem and how to solve it. Group members help if needed on these followup problems involved in Activity D.

Activity F:

Teacher goes over specific, difficult problems she may have discovered from the previous activities.

Appendix B

Teacher Packet

Multiplication and Division Story Problems

Materials needed:

1. **Sack of lima beans (at least 500 or 600 beans)**
2. **Ruler or measuring tapes for each student**
3. **masking tape**
4. **paper and pencil for drawings**
5. **scissors for each student**
6. **crayons for each student**

Teacher Packet

Multiplication and Division Story Problems

Activity A: Teacher with the Whole Class

1. A used car lot had 8 rows of cars. There were 12 cars in each row. How many cars are on the lot?

Let groups of 4 or 5 children around the room each have a set of 100 beans. Make sure each student can see a group of beans. Have the children with beans arrange them as the story problem says - 8 rows with 12 in each row. Remember that rows go across. See that the children have them in 8 rows and not 12 rows.

Ask: Could we work this by addition? What would be the addition sentence? Write it on the chalkboard when a pupil tells you.

$$12+12+12+12+12+12+12+12=\square$$

Could we write it up and down? What would I write? Let a child tell you. Write 8 twelves in a vertical column.

Ask: How many 12's are there? How could we write that as a multiplication sentence? (Let a pupil respond.)

$$8 \times 12 = \square$$

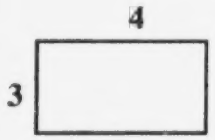
How many rows?
How many in each row?
What will the answer or product mean?
How could we write it up and down?

$$\begin{array}{r} 12 \\ \times\ 8 \\ \hline \end{array}$$

What does the 8 mean?
What does the twelve mean?
What will the answer or product mean?
Note: (Keep these in consistent order.)

2. There is a rectangle on a sheet of paper that is 3 inches by 4 inches. What is the area of the surface?

Ask students to draw the rectangle with a ruler. Make sure they have the 3 inches on the side since that is what 3 by 4 means. Ask them to mark off square inches in the rectangle.



Ask the pupils to count the number of square inches? How many? 12. Ask them to notice how many rows. Make sure they understand that rows are across. 3 rows. How many in each row? 4. 3 rows with 4 in each row.
What addition number sentence could show this?

$$4+4+4=\square$$

How many groups of 4? 3.
How many in each group?
What multiplication sentence would show this?

$$3 \times 4 = \square$$

What does the 3 mean?
What does the 4 mean?
What will the answer or product mean?

How would we write this up and down or in vertical form?

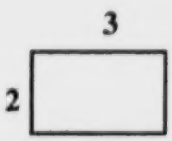
$$\begin{array}{r} 4 \\ \times\ 3 \\ \hline \end{array}$$

What does the 3 mean?
What does the 4 mean?
What does the answer or product mean?

3. There is a section of the floor in the middle of our classroom that we wish to paint black for a game we want to play. The section is 2 feet by 3 feet. How many square feet are in the section?

Have 2 pupils use a ruler or tape measure and masking tape to mark off the 2 foot by 3 foot rectangle in the center of the classroom, then ask 2 other students to mark off square feet with the masking tape.

Ask other students to make a small drawing on paper to model this.



Ask them what addition number sentence would fit this?

$$3+3 = 6$$

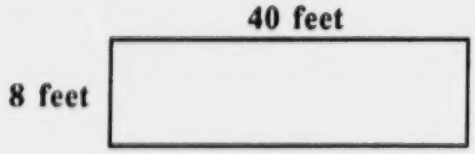
Ask what multiplication sentence?

$$2 \times 3 = \square$$

What does the 2 mean?
What does the 3 mean?
How many square feet of surface area in the whole rectangle? 6

4. There is a wall in a room that I wish to paint. The wall is 8 feet by 40 feet. I want to give the wall 2 coats of paint. The paint I want to buy states on the bucket that each gallon covers approximately 320 square feet per gallon. The paint comes only in gallons. How much will it cost to purchase the paint for the wall if the paint costs $10 per gallon?

Ask the students to draw a rectangle to represent the wall.



Ask how many rows of square feet are on the wall. 8. Ask how many square feet in each row? 40. If we wanted to add to find the surface area how would we do it? Add 8 forties. What multiplication sentence would fit this situation?

$$8 \times 40 = \square$$

What does the 8 mean?
What does the 40 mean?
What will the answer mean?
How would we write the multiplication up and down or vertically?

$$\begin{array}{r} 40 \\ \times\ 8 \\ \hline \end{array}$$

Ask what each number means.
What do we need to know next?
We know that there are 320 square feet of surface area on the wall. How many coats of paint? 2.

What multiplication sentence would help us find how many total square feet we must cover with paint?

$$2 \times 320 = \square$$

What does the 2 mean ?
What does the 320 mean?
How would we write this up and down or vertically?

$$\begin{array}{r} 320 \\ \times\ 2 \\ \hline \end{array}$$

How many total square feet of area do we need to cover? 640 square feet.
What do we need to know next?
How many gallons of paint?
How could we find that?

Each gallon will cover approximately 320 square feet. How would we find how many gallons of paint we need? (Let students respond.)

$$320 \overline{)\ 640}$$

What does the 640 mean?
What does the 320 mean?
What will the answer or quotient mean?

We need 2 gallons of paint. What number sentence would help us find the cost?

$$2 \times \$10 = \square$$

What does the 2 mean?
What does the $10 mean?
What will the answer or product mean?

5. Bill and his parents are going to take a trip. It is 400 miles from where they live. Their car gets approximately 20 miles per gallon. About how many gallons of gas will be needed for the trip?

Ask pupils to draw a line to represent the 400 miles of highway. Could you use this to figure out how many gallons of gas would be needed? Guide students into something like this:

0 400

20 mis. 20 mis. 20 mis. 20 mis. 20 mis. 20 mis. 20 mis. 20 mis.

How many gallons does each 20 miles represent?
What division sentence would help us find the number of gallons of gas needed?

$$400 \text{ mis.} \quad 20 \text{ mis.} = \square$$

What does the 400 mean?
What does the 20 mean?
What will the answer or quotient mean?

How could we write the division in computational form?

$$20\overline{)400}$$

What does the 400 mean?
What does the 20 mean?
What will the answer or quotient mean?

6. There were 20 boys and girls who wanted to play some games. They had 4 games and decided to separate themselves into even groups to play the games. How many boys and girls will be in each game center?

Have 20 pupils stand. Ask how many groups we wanted. 4. What number sentence fits this story problem?

$$20 \quad 4 = \square$$

What does the 20 mean?
What does the 4 mean?
What will the answer mean?

How would this be written in computation form?

$$4\overline{)20}$$

What does the 20 mean?
What does the 4 mean?
What will the answer or quotient mean?

Note: Bring out the idea of 4 groups with 5 per group.

May repeat using beans to represent the 20 children. Ask a child to use X's to draw a picture of this situation after the groups have been separated out.
How many groups? 4
How many per group? 5

7. There are 21 students and we want to form teams with 7 students on each team. How many teams will we have?

Have 21 students stand. Ask a student to separate them in the way the problem asks. Does the 7 mean groups or things per group or teams or students per team? Things per group or groups?

What number sentence is suggested by this?

$$21 \div 7 = \square$$

What does the 21 mean?
What does the 7 mean?
What will the answer mean?

Go through the problem letting students use beans to model the problem?

Stress the meaning of each part of the number sentence. How would this problem look in computational form?

$$7\overline{)21}$$

What does the 21 mean?
What does the 7 mean?
What will the answer mean?

Have students put 21 beans in 1 group again. Ask: Could we take groups of 7 away to find how many 7's? Show on the chalkboard.

21	
-7	1 group of 7
14	
-7	1 group of 7
7	
-7	1 group of 7
0	3 groups of 7 or 3 x 7

8. I have 4 boxes of candy with 6 pieces of candy in each box. How many pieces of candy do I have in all?

Have children use beans. Draw squares to represent the 4 boxes. Have them place 6 beans (candy) in each box. What number sentence is suggested here for addition?

$$6+6+6+6 = \square$$

How many groups of 6? 4. What would be the multiplication sentence suggested by this arrangement?

$$4 \times 6 = \square$$ (Note: 6 x 4 will not do.)

What does the 6 mean?
What does the 4 mean?
What will the answer or product mean?

How would this be written in vertical (up and down) form?

$$\begin{array}{r} 6 \\ \times\ 4 \\ \hline \end{array}$$

Go over what each number would mean.

Have them put all the beans together. How many pieces of candy in all? 24.

9. Sally has a blue sweater and a red sweater. She also has a green skirt, a black skirt and a white skirt. How many combinations of outfits can she get out of these sweaters and skirts?

Have the students make small cutouts of the sweaters and skirts. Let students work with 2 or 3 students around them. Let them figure out how many combinations.

On the chalkboard have students help you develop this table:

	Green Skirt	Black Skirt	White Skirt
Blue sweater	Blue sweater/ green skirt	Blue sweater/ black skirt	Blue sweater/ white skirt
Red sweater	Red sweater/ green skirt	Red sweater/ black skirt	Red sweater/ white skirt

10. My mother calls her sister who lives in another town twice weekly. The phone calls average $1.50 per call. How much would the calls cost for 4 weeks.

Read the problem. What are we being asked? Do you think we will multiply or divide to get the answer?

How many weeks?
How many calls per week?

Could we make a little chart to show this? See if pupils can help you make the following chart.

			Week's Total
Week 1	2 calls	$1.50 each	$3.00
Week 2	2 calls	$1.50 each	$3.00
Week 3	2 calls	$1.50 each	$3.00
Week 4	2 calls	$1.50 each	$3.00

Can someone think of a multiplication sentence for this problem? Let a child write it on the board.

$4 \times \$3 = \square$

Can someone write it vertically?

$$\begin{array}{r} \$\ 3 \\ \times\ 4 \\ \hline \end{array}$$

In each case ask:
What does the 4 mean?
What does the $3 mean?
What will the answer or product mean?

Activity B: Small Group Activity

Separate the children into groups by counting off to 5 with all the 1's in one group, 2's in a group, and so on. Ensure that each group has a mixture of abilities.

Use the student worksheet of 10 multiplication and division problems. Direct the students to take turns working the story problems and doing the drawings, number lines, or explaining as requested after each problem. Have other group members help if needed.

1. Jim is going to have a party. He wants to provide 2 small pizzas for each guest. The freezer has 36 small pizzas in it. How many guests can he have?
(Draw circles and stick figure people to show this problem.)

2. My family is taking a trip to a resort which is 400 miles from home. If we can average 50 miles per hour in our car, how long will it take to get there?
(Use number lines to show this problem.)

3. How many 6-ounce servings can be poured from a pitcher with 120 ounces of orange juice?
(Explain how you could use subtraction to find the answer.)

4. You can have your choice of a hamburger, a grilled cheese sandwich, or a ham sandwich. You can choose to drink a coke or an orange soda. How many different combinations could you select from? (Prepare a table or write down each combination to figure this problem.)

5. A car averages 55 miles per hour on a trip. How far can the car travel in 6 hours?
(Use number lines to show the problem.)

6. A car travels 800 miles in 16 hours. How many miles per hour did the car average?
(Use number lines to solve this one.)

7. A sheet of stamps has 5 rows with 12 stamps in each row. How many stamps are in the whole sheet?
(Use a drawing to figure out this problem.)

8. Sixty students want to form teams of 2. How many teams will there be?
(Explain how you could use subtraction to figure out this problem.)

9. Forty-five students are to be placed into 3 equal teams. How many will be on each team?
(Show with drawings of squares the meaning of this problem.)

10. There are 8 large cabins in a camp. Twenty-five students can stay in each cabin. How many students can come to the camp at one time.
(Use drawings with squares and numbers to show this problem.

Activity C: Small Groups with Problems from the Text

Select 10 multiplication/division problems from the text. Let the students take turns working problems with the rest of the group helping if needed.

Teacher monitors and helps students if needed.

Activity D: Individual Work

Select 5 to 10 story problems from the text on multiplication and division for students to solve on their own. You may wish to pair weak students with stonger students.

Activity E: Group Sharing

Let students take turns in small groups explaining each problem from Activity D. Group members are to help if necessary.

Activity F:

Teacher goes over specific, difficult problems she may have discovered from the previous activities.

Appendix C

Name:_____

Teacher: _____

Story Problem Skills Test

DIRECTIONS: Read each of the following problems carefully. Solve these on a separate sheet of paper and write the answer at the bottom of each problem.

1. Sue's mother tells her and her sisters that they can have either a baloney sandwich, a peanut butter and jelly sandwich, or a cheese sandwich. They are told that they may drink milk or strawberry soda. How many combinations of sandwiches and drinks can they select from?

2. The local church summer softball league had 8 teams with 15 people on each team. How many total players did they have?

3. Julie has 5 rows of stamps with 8 stamps in each row. How many stamps does she have?

4. The teacher has 26 candy eggs. If she wants to give 2 eggs to each student, how many children can get 2 eggs?

5. Paul had 40 model cars. He decides to arrange them into 5 rows. How many cars will be in each row?

6. There were 19 boys who wanted to play a game which needed 5 players for each team. How many teams could they have? How many were left over?

7. Eight marbles cost 56 cents. How much would one marble cost?

8. Jamie had 15 pieces of bubble gum. She gave 7 to Susie. How many pieces of bubble gum did she have left?

9. There were three small Villages by a small lake. One village had 125 people, another had 117 people, and the third one had 123 people. How many people lived around the lake?

10. Bob has 47 pennies. Betty has 96 pennies. How many more pennies does Betty have than Bob?

11. Sherry has a ribbon which cost 75 cents, one which cost 95 cents and one which cost 80 cents. How much did all of her ribbons cost?

12. Jan needs 97 cents to buy a hair ribbon. She has only 42 cents. How much more money does she need?

13. Milton earned $23.15 in one week. He earned $15.05 delivering sales circulars. How much did he earn doing other jobs?

14. There are four cabins at Camp Simpson. One cabin has 23 boys, one has 26 boys and two cabins have 14 boys each. How many boys are at Camp Simpson?

15. Don has 32 rabbits. Twenty-seven are white and the rest are black. How many are black?